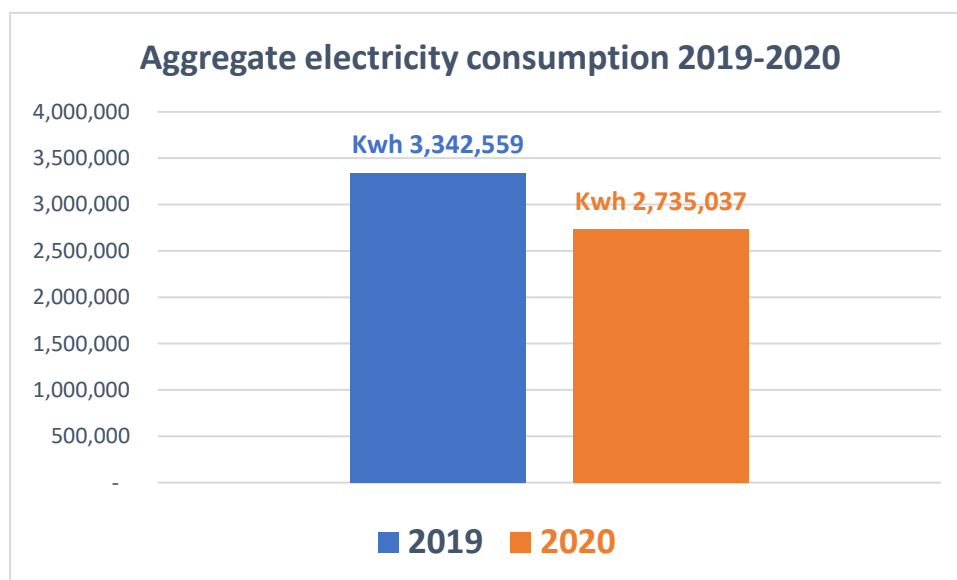


EUI ENERGY REPORT 2020

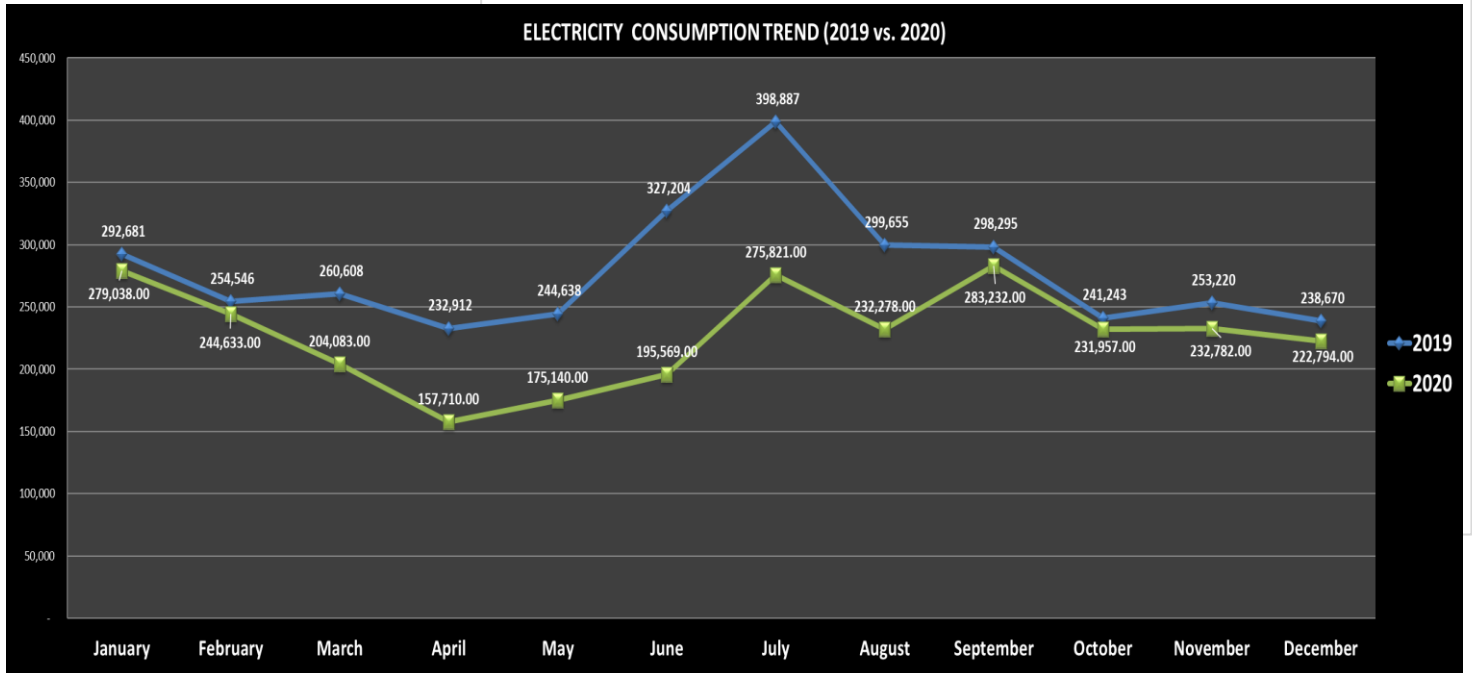
Due to the unexpected and unpredictable circumstances of 2020, with the whole world upset and disrupted by the Covid-19 pandemic, over the course of the year the overall electrical consumption in the EUI premises (including EUI residences at PAB and PDM) resulted in a total of 2.735.037 Kwh*, which, compared to the official data for 2019 (3.342.559 Kwh)*, shows a significant decrease of **-18,18%** in absolute terms: the beyond-expectations performance and the relevant causes (the objective was to reduce consumption by 1 to 3%) have already been illustrated and discussed in the Action Plan Completion section (see p. 56), although some additional clarifications should be considered.

The reduction of aggregate consumption was matched by a decrease in expenditure: the budgetary balance highlighted a decrease of approx. **-26.70%**: the different % (higher in cost savings than in consumption savings) depends on the fact that the existing contract does not provide for a fixed price but for a fixed spread on the monthly price for energy established by the Authority (PUN), which in 2020 registered an average of **-25.61%**** on annual basis (38.92 €/Mwh vs 52.32 €/Mwh).

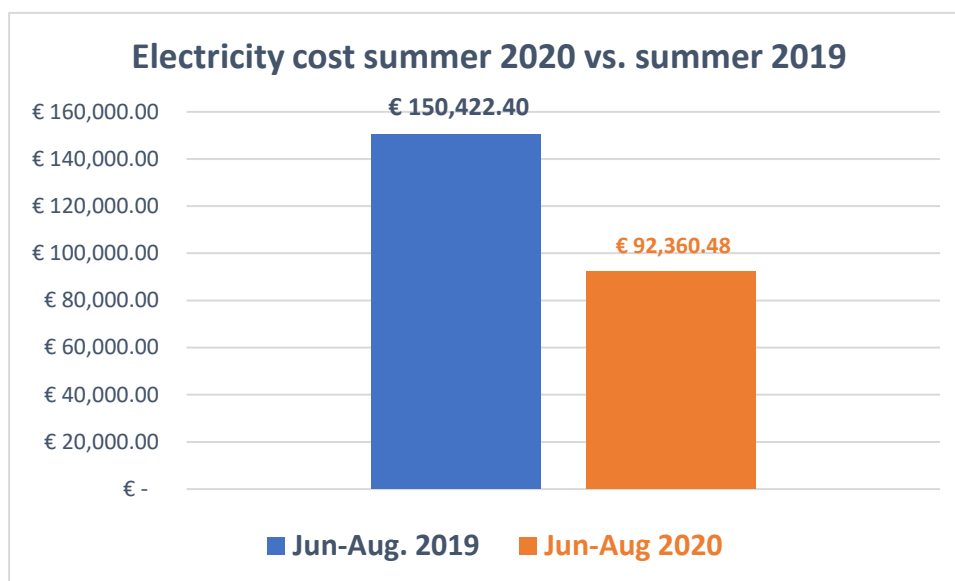


(*data source: EDISON monthly invoices Jan-Dec 2019-2020, available for consultation at S:\Filing Plan\LO.01 Infrastructure and maintenance\01 Maintenance\Utilities\ENERGIA ELETTRICA).

(**data source: <http://www.mercatoelettrico.org/It/Statistiche/ME/DatiSintesi.aspx>)



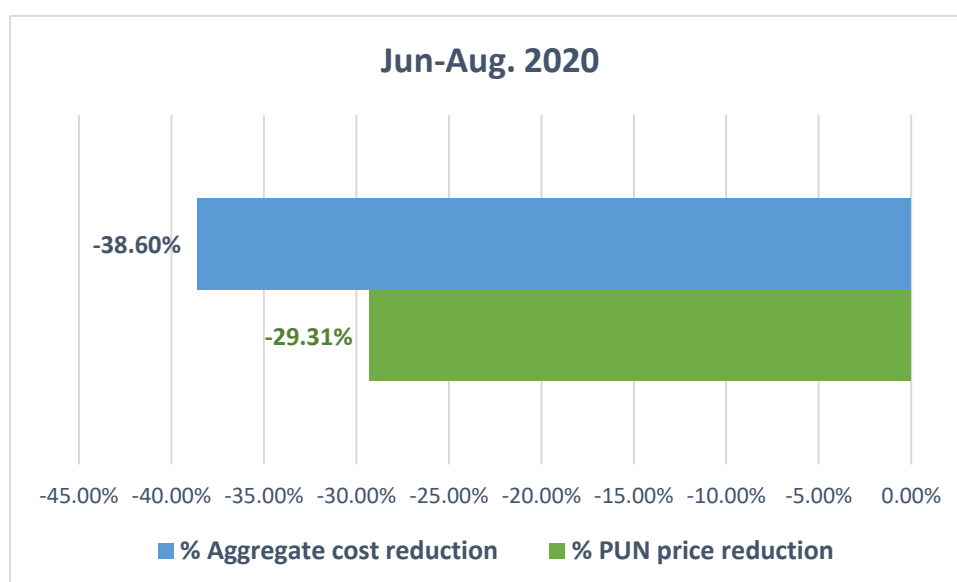
The chart above puts in evidence, as already explained at pp. 56-58, that the aggregate electricity consumption in 2020 (green line) decreased in every month compared to 2019 (blue line) with a more significant drop between March and July, corresponding to the hardest lockdown period, **(- 31% on average, with a peak of -40.23 in June)**. Contributing factors to the consumption decrease are to be retrieved in the extremely limited attendance of the EUI Campus during the whole year, also during the summer months (for the first time the campus was entirely closed from 8 to 23 August). The summer trimester (JUN-AUG), as already mentioned above, shows in fact a decreased consumption of **-31.34%** (see chart below):



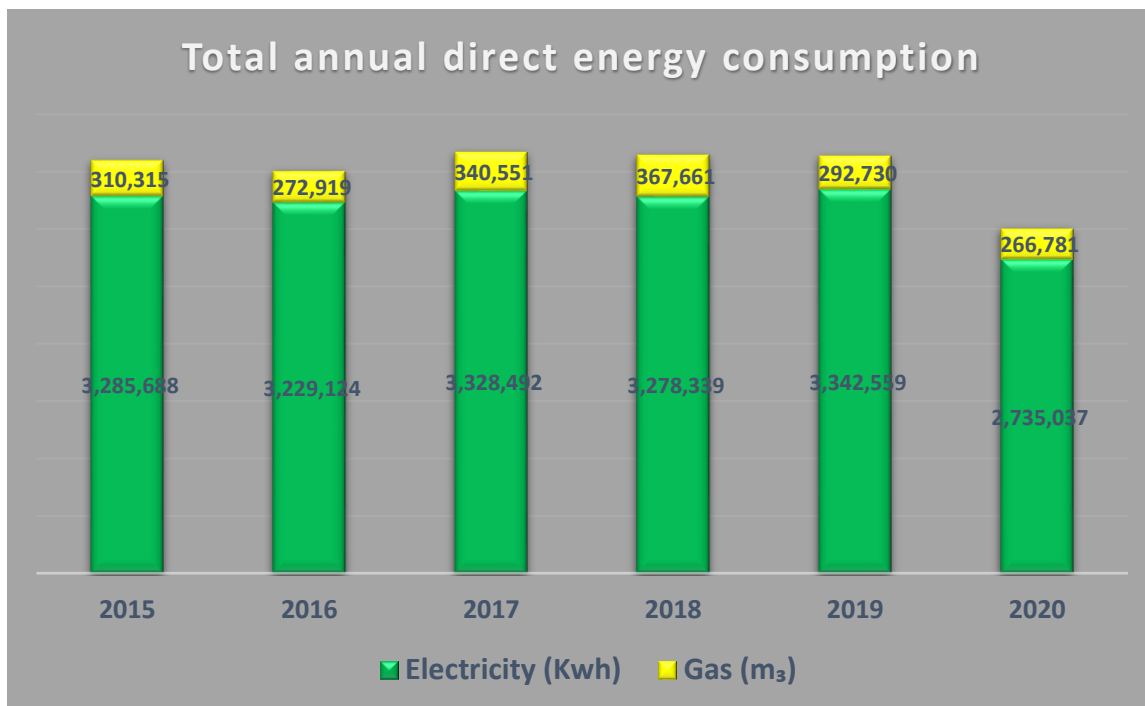
On the financial side, in front of a reduction of the unit price by 29.31% for the examined period¹, the REFS budget registered savings amounting to 38.6%, corresponding to -€ 58,061.92 (see charts below).

Average PUN price Jun-August 2020	35,44 €/Mwh
Average PUN price June-August 2019	50,14 €/Mwh

(¹data source: <http://www.mercatoelettrico.org/It/Statistiche/ME/DatiSintesi.aspx>)

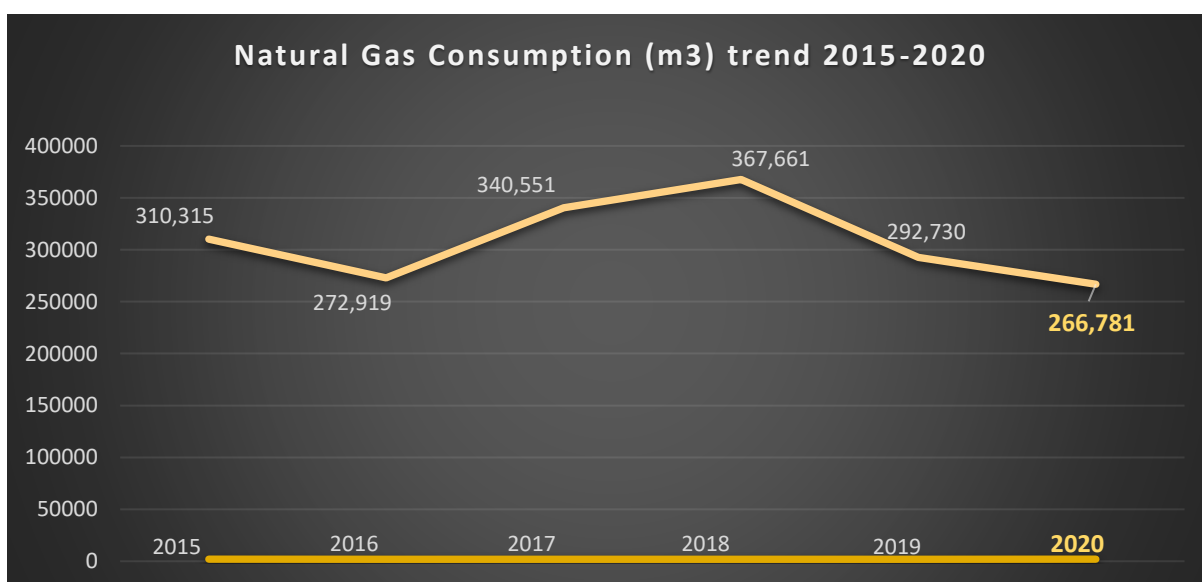


Looking at the comparative analysis of aggregate direct energy consumption (natural gas + electricity) over the period 2015-2020:



We observe that, regardless of actual values, the incidence of both Kwh and m₃ in 2020 drops dramatically compared with previous years.

In 2020 the EUI registered the lowest result in terms of gas consumption over the past 3 years (266,781 m₃)³, thus continuing the ever decreasing trend begun in 2019:



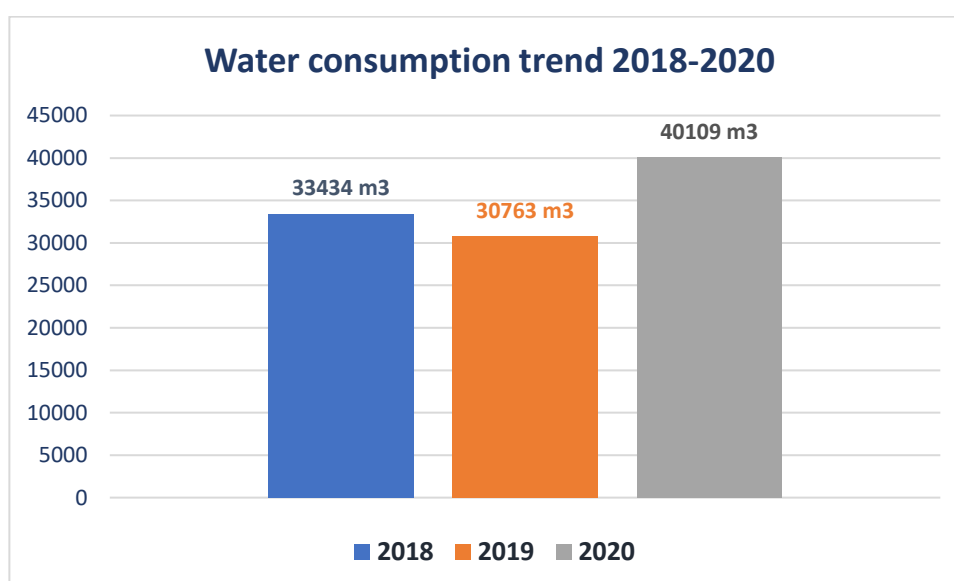
Going into details, the total difference with 2019 amounts to -8.86% (-25.949m₃)³, which is not comparable to the huge reduction registered for electricity over the same period: this depends mainly on the fact that the hardest limitations on campus access were effective between March and August, when the impact of gas consumption is definitely lower than during the winter months.

It appears evident from all available data that 2020 cannot be considered a benchmark year for the assessment of energy saving provisions (both electricity and gas), which will have to be continuously reassessed and carefully monitored in the upcoming years (taking into account that the epidemiological situation might not yet have improved in 2021)

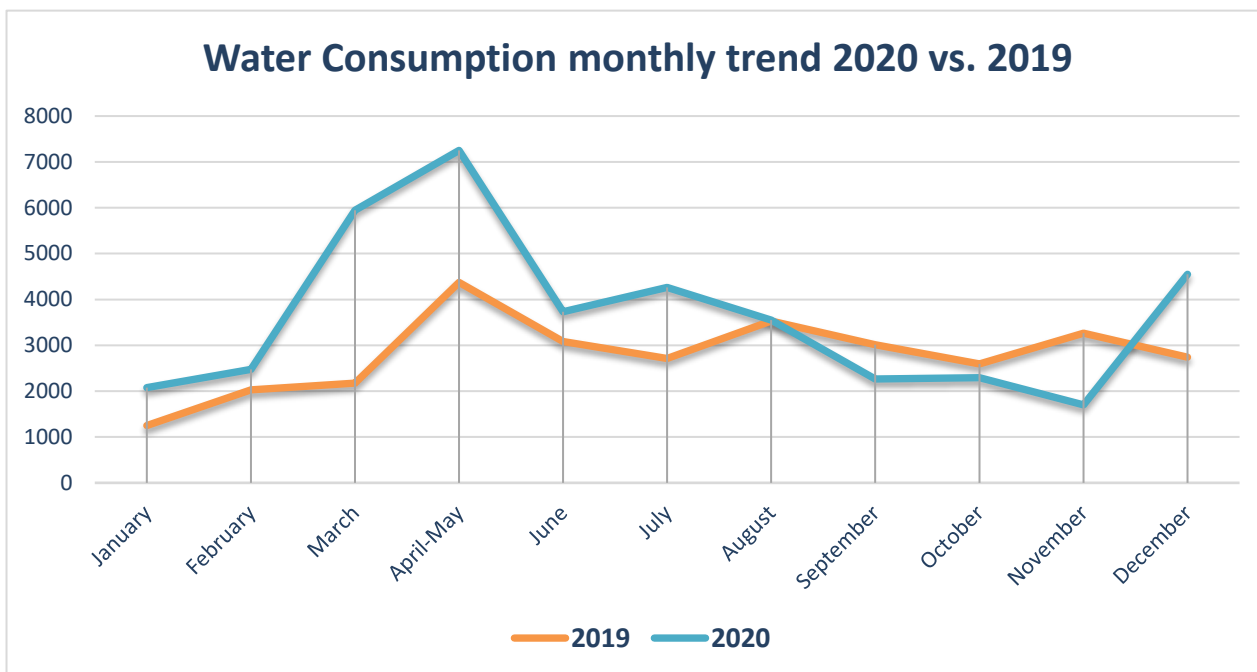
(³data source: monthly reading of gas meters recorded in excel files and matched with monthly invoices by gas suppliers (S:\Filing Plan\LO.01 Infrastructure and maintenance\01 Maintenance\Utilities\GAS))

As water consumption represents one of the biggest issues for the REFS, in terms of utilities management, in 2020 the technical unit launched a special project dedicated to the installation of automated water meters across the EUI campus (due to be completed in 2019, it was postponed and delayed until Q1 2021), in order to gather real-time information on water consumption and eventually detect leakages and other disruptions. Water meters will hopefully be operational by the Q2 2021, so that, unfortunately no specific improvements are related to 2020.

We must once again highlight that the EUI suffered significant number of unpredictable leakages in the water pipe system over the course of 2020: that is why, despite the limited attendance of the campus, the aggregate volume consumed in 2020 amounts to 40.109 m₃* which is a very bad result compared with 2018 (33.434 m₃) and 2019 (30763 m₃): on annual scale the increase corresponds to +30.38% (+9.346 m₃) on the previous year.



The annual trend is definitely more stable and less schizophrenic than 2018, with a peak in August and November (see chart below):



*data source: monthly reading of water meters recorded in excel files and matched with monthly invoices by water suppliers (S:\Filing Plan\LO.01 Infrastructure and maintenance\01 Maintenance\Utilities\ACQUA)

In general, comparing the 2020 energy/gas/water consumption with the previous year's, we can highlight an extremely good result for gas and electricity (although depending on external factors) and a pivotal under-performance for water (so far conditioned by uncontrollable variables: the overall consumption expenditure, with the exception of water-related bills, has considerably decreased, hence the building efficiency value (BE) registers very low values for this year.

In terms of sustainability, the EUI 2020 carbon footprint on utilities consumption and the comparative analysis with 2019 can be illustrated in the tables below³:



Electricity -18.18%

Electricity 2019 (3,342,559 Kwh)

Pollutant	emissions (Kg)
Carbon monoxide (CO)	734.0258977
Carbon dioxide (CO2)	2,539,922.14
Nitrogen oxides (Nox)	5,607.48
particulates	1,167.22
Sulphur oxides (Sox)	16,256.87

Electricity 2020 (2,735,037 Kwh)

Pollutant	emissions (Kg)
Carbon monoxide (CO)	600.6140772
Carbon dioxide (CO2)	2,078,282.25
Nitrogen oxides (Nox)	4,588.30
particulates	955.07
Sulphur oxides (Sox)	13,302.12



Natural gas - 8.86%

Natural Gas 2019 (292,730 m₃)

Pollutant	emissions (Kg)
Carbon monoxide (CO)	93.6736
Carbon dioxide (CO2)	567,620.30
Nitrogen oxides (Nox)	502.763775
particulates	146.365
VOC emissions	100.552755

Natural Gas 2020 (266,781 m₃)

Pollutant	emissions (Kg)
Carbon monoxide (CO)	117.65
Carbon dioxide (CO2)	712,915.82
Nitrogen oxides (Nox)	631.46
particulates	183.83
VOC emissions	126.29

³conversion factors according to ANPA, Banca dati I-LCA ver. 2.0, 2000 – Rapporto ETH-ESU, 1996



Carbon Footprint (utilities) Overall result*

	2019	2020
Carbon monoxide (CO)	827.70	685.99
Carbon dioxide (CO2)	3,107,542.44	2,595,585.95
Nitrogen oxides (Nox)	6,110.24	5,046.50
particulates	1,313.59	1,088.46
VOC emissions	16,357.42	13,393.76

*Expressed in Kgs



CO2 -16.47%

PI on Environmental Sustainability (utilities consumption) = CFR (% of CO2 Kgs Reduction)

CFR= - 16.47%

PI on Energy Management = BE (Buildings efficiency)*

BE = € 15.91/sqm

(The BE value for 2019 was 19.61 €/sqm)

*the value is obtained by dividing the 2020 overall utilities cost (electricity, water, natural gas, gas oil) for the total sqm surface of the EUI